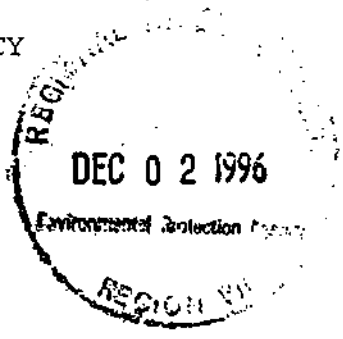


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 Date: 12-2-96
 CWR

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION VII
 726 MINNESOTA AVENUE
 KANSAS CITY, KANSAS 66101



)
 IN THE MATTER OF:)
)
 LAIDLAW WASTE SYSTEMS (BRIDGETON), INC.)
)
 Respondent.)
)
 _____)

Docket No.
 VII-94-F-0025

SECOND AMENDMENT TO ADMINISTRATIVE ORDER ON CONSENT

WHEREAS, the United States Environmental Protection Agency, Region VII ("EPA") and Laidlaw Waste Systems (Bridgeton), Inc. ("Respondent"), entered into an Administrative Order on Consent which was filed with EPA Region VII's Hearing Clerk on December 19, 1994, under Docket Number VII-94-F-0025 (the "AOC"); and

WHEREAS, Section XXVII, paragraph 92, of the AOC provides that "[t]his Consent Order may be amended by mutual agreement of EPA and Respondent. Amendments shall be in writing and shall be effective when signed by EPA."; and

WHEREAS, EPA and Respondent now wish to amend the AOC.

NOW, THEREFORE, EPA and Respondent amend the AOC as follows:

1. The first sentence of paragraph 22(b)(2) of Section VIII (Work to be Performed) of the AOC is hereby deleted and the

following sentence inserted in its place: "Within sixty (60) days of EPA's approval of the Baseline Risk Assessment (described below), Respondent shall submit to EPA a Remedial Investigation Report prepared in accordance with the SOW, RI/FS Workplan, and Sampling and Analysis Plan."

2. Paragraph 22(d)(1) of Section VIII (Work to be Performed) of the AOC is hereby deleted and the following sentence inserted in its place: "Within sixty (60) days of EPA's approval of the Baseline Risk Assessment, Respondent shall submit to EPA for review and approval a memorandum on remedial action objectives prepared in accordance with the SOW."

3. The following shall be inserted as new Subsection 22(f) in Section VIII (Work to be Performed) of the AOC:

"f. Task VI - Risk Assessment. Respondent shall identify and characterize actual and potential risks to human health and the environment in accordance with the attached Statement of Work and EPA's Framework for Ecological Risk Assessment, EPA/630/R-92/001 and EPA's Risk Assessment Guidance for Superfund which is comprised of the following two volumes: the Human Health Evaluation Manual, (December 1989) (EPA/540/1-89/002), and the Environmental Evaluation Manual, (March 1989) (EPA/540/1-

89/001). During the risk assessment, Respondent shall provide EPA with the following deliverables, which are further described in the Statement of Work:

(1) Technical Memorandum Identifying Contaminants and List of Proposed Indicator Chemicals. Within forty-five (45) days of receipt of EPA's comments on the Site Characterization Summary Report, Respondent shall submit to EPA for review and approval a Technical Memorandum Identifying Contaminants and List of Proposed Indicator Chemicals (i.e., chemicals of potential concern, as described in the Risk Assessment Guidance for Superfund). If EPA disapproves of, comments on, or requests modifications to, the Technical Memorandum Identifying Contaminants and List of Proposed Indicator Chemicals, in whole or in part, Respondent shall submit to EPA a revised Technical Memorandum Identifying Contaminants and List of Proposed Indicator Chemicals within thirty (30) days of receiving EPA's comments.

(2) Memoranda on Exposure Scenarios and Fate and Transport Models. Within forty-five (45) days of receipt of EPA's comments on the Technical Memorandum Identifying Contaminants and List of Proposed Indicator Chemicals,

Respondent shall submit to EPA for review and approval a Memorandum on Exposure Scenarios and Fate and Transport Models. If EPA disapproves of, comments on, or requests modification to, the Memorandum on Exposure Scenarios and Fate and Transport Models, in whole or in part, Respondent shall submit to EPA a revised Memorandum on Exposure Scenarios and Fate and Transport Models within thirty (30) days of receiving EPA's comments.

(3) Toxicological and Epidemiological Studies Memorandum. Within forty-five (45) days of receipt of EPA's comments on the Memorandum on Exposure Scenarios and Fate and Transport Models, Respondent shall submit to EPA for review and approval a Toxicological and Epidemiological Studies Memorandum that will be used to perform the toxicity assessment for chemicals lacking an EPA toxicity value. If EPA disapproves of, comments on, or requests modification to, the Toxicological and Epidemiological Studies Memorandum, in whole or in part, Respondent shall submit to EPA a revised Toxicological and Epidemiological Studies Memorandum within thirty (30) days of receiving EPA's comments.

(4) Baseline Human Health Risk Assessment Chapter of the RI Report. Within forty-five (45) days of receipt of EPA's comments on the Toxicological and Epidemiological Studies Memorandum, Respondent shall submit to EPA for review and approval a Baseline Human Health Risk Assessment Report. If EPA disapproves of, comments on, or requests modification to, the Baseline Human Health Risk Assessment Report, in whole or in part, Respondent shall submit to EPA a revised Baseline Human Health Risk Assessment Report within thirty (30) days of receiving EPA's comments. The approved Baseline Human Health Risk Assessment Report shall be incorporated into the RI report.

(5) Environmental Evaluation Plan: Within forty-five (45) days of receipt of EPA's comments on the Baseline Human Health Risk Assessment Chapter of the RI Report, Respondent shall submit to EPA for review and approval an Environmental Evaluation Plan. If EPA disapproves of, comments on, or requests modification to, the Environmental Evaluation Plan, in whole or in part, Respondent shall submit to EPA a revised Environmental Evaluation Plan within thirty (30) days of receiving

EPA's comments.

(6) Environmental Evaluation Report. Within forty-five (45) days of receipt of EPA's comments on the Environmental Evaluation Plan, Respondent shall submit to EPA for review and approval an Environmental Evaluation Report. In the alternative, and at Respondent's discretion, the Environmental Evaluation Report may be included in the Baseline Risk Assessment Report. If EPA disapproves of, comments on, or requests modification to, the Environmental Evaluation Report, in whole or in part, Respondent shall submit to EPA a revised Environmental Evaluation Report within thirty (30) days of receiving EPA's comments."

4. Section IX of the AOC which is entitled "EPA's Baseline Risk Assessment" shall be deleted in its entirety. Section IX shall be reserved, and such deletion shall not affect the numbering of the Sections and paragraphs that follow Section IX.

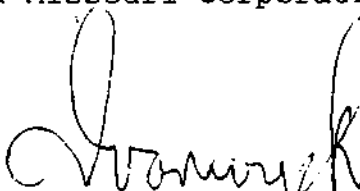
5. The Statement of Work ("SOW") attached to the AOC as Attachment II, which is incorporated into, and a part of the AOC, is hereby amended and restated in the attached exhibit. The

amended and restated SOW attached hereto shall supersede and replace the SOW in the AOC.

For Laidlaw Waste Systems (Bridgeton), Inc., a Missouri corporation:


LAIDLAW WASTE SYSTEMS (BRIDGETON), INC.,
a Missouri corporation

November 14, 1996



By: Dick van Wyck
Its: Secretary

For the United States Environmental Protection Agency:

11/27/96, 1996


Michael J. Sanderson
Director, Superfund Division
U.S. Environmental Protection Agency

11/19, 1996


David A. Hoefler
Assistant Regional Counsel
U.S. Environmental Protection Agency

ATTACHMENT II

**AMENDED AND RESTATED
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
STATEMENT OF WORK
WEST LAKE LANDFILL OU-2**

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1.0 INTRODUCTION

This document is the Statement of Work ("SOW") incorporated by reference in the United States Environmental Protection Agency ("EPA") - West Lake Landfill Administrative Order on Consent ("AOC") for Remedial Investigation/Feasibility Study ("RI/FS") Operable Unit Number 2, EPA Docket No. VII-94-F-0025, for the conduct of an RI/FS at the West Lake Landfill, National Priorities List ("NPL") site located in Bridgeton, Missouri. The purpose of the RI/FS is to investigate the nature and extent of contamination, assess the potential risk to human health and the environment presented by such contamination, and develop and evaluate potential remedial alternatives at the Site. The definition of "Site" as used herein, shall be the same as in the AOC. The terms "contamination", "contaminant", "waste", etc., as used herein refer to any hazardous substance within the meaning of Section 101(14) and 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended ("CERCLA"), 42 U.S.C. § 9601(14) & (33). The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies, as needed.

Respondent shall conduct this RI/FS and shall produce a draft RI and FS report that are in accordance with this SOW, the Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01, October 1988), and any other guidance that EPA uses in conducting a RI/FS, as well as any additional requirements in the AOC. A list of primary guidance documents is presented in Section 9.0 of this SOW. The RI/FS Guidance describes the report format and the required report content. Respondent shall furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the AOC.

Upon the completion of the RI/FS, EPA will be responsible for the selection of a Site remedy and will document this selection in

a Record of Decision. The remedial action alternative selected by EPA will be consistent with the streamlined RI/FS guidance for CERCLA Municipal Landfill Sites and the Presumptive Remedy for CERCLA Municipal Landfill Sites guidance and will be selected to be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements typically referenced in streamlined RI/FS projects, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable.

As specified in Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1), EPA will provide oversight of Respondent's activities throughout the RI/FS. Respondent shall support EPA's initiation and conduct of activities related to the implementation of oversight activities.

2.0 TASK I - SCOPING

Scoping is the initial planning process of the RI/FS and is initiated by EPA. During scoping, the Site-specific objectives of the RI/FS are determined by EPA. Respondent shall document the specific project scope in a workplan. Because the work required to perform a RI/FS is not fully known at the onset, it may be phased in accordance with a site's complexity and the amount of available information. The number of phases and precise activities contained in each phase shall be determined during Project Scoping and described in detail in the RI Workplan. At present the following phases are envisioned.

1. Phase I: This phase shall consist of the implementation of Tasks I through V. These tasks are discussed in detail in the following subsections
2. Phase II: Based on the results of Phase I, Phase II activities may consist of: performing additional RI activities as needed to refine the Site conceptual models or respond to emergent issues; implementing treatability studies, as needed; and

refining the FS, as needed. The exact nature or need of these activities is not known at this time.

The phases may overlap depending upon the nature and amount of interaction between the RI and FS activities. It may be necessary to modify the RI/FS Workplan during the RI/FS to satisfy the objectives of the study. EPA recognizes that Operable Unit 1 activities being conducted at the site may yield regional and local data which can be referenced in Operable Unit 2 activities. It is EPA's goal to eliminate duplication of effort between the two Operable Units wherever practicable.

When scoping the specific aspects of a project, Respondent shall meet with EPA to discuss project planning decisions and special concerns associated with the Site. The following activities shall be performed by Respondent as a function of the project planning process.

2.1 Site Background

Respondent shall gather and analyze Site background information and shall conduct a Site visit to assist in planning the scope of the RI/FS.

2.1.1 Collect And Analyze Existing Data And Document The Need For Additional Data

Before planning RI/FS activities, all Site data shall be compiled and reviewed by Respondent. Specifically, this shall include presently available data relating to the varieties and quantities of hazardous substances at the Site, and past disposal practices. This shall also include results from any previous chemical sampling events and hydraulic monitoring that have been conducted, as well as available Site information and analytical data pertaining to the Remedial Investigation/Feasibility Study presently being conducted for Operable Unit No. 1 (EPA Docket No. VII-93-F-0005). This information shall be utilized in determining additional data needed to characterize the Site, better defining potential

applicable or relevant and appropriate requirements ("ARARs"), and developing a range of preliminary identified remedial alternatives. Data Quality Objectives ("DQOs") shall be established, subject to EPA approval, specifying the usefulness of existing data. Decisions on data necessary for performance of the Baseline Risk Assessment and DQOs shall be made by EPA with consideration of comments by Respondent.

Respondent shall review aerial photographs of the Site to help characterize drainage and surficial soils in the vicinity of the Site and to evaluate berm construction and waste disposal practices conducted at the landfill.

2.1.2 Site Visit

Respondent shall conduct a Site visit during the project scoping phase to assist in developing a conceptual site model of the physical and chemical framework for the Site, sources and areas of contamination, as well as potential exposure pathways and receptors at the Site. During the Site visit Respondent should observe the Site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological, and cultural features. This information shall be utilized to better scope the project and to determine the extent of additional data necessary to characterize the Site, better define potential ARARs, and narrow the range of preliminarily identified remedial alternatives.

2.2 Project Planning

Once Respondent has collected and analyzed existing data and conducted a Site visit, the specific project scope shall be planned. Project planning activities include those tasks described below as well as identifying data needs, developing a workplan, designing a data collection program, and identifying health and safety protocols. Respondent shall meet with EPA regarding the following activities and before drafting the scoping deliverables referenced in the following sections.

2.2.1 Develop A Conceptual Site Model

Information on the physical and chemical framework for the Site, potential waste sources, potential contaminant migration and exposure pathways, and receptors at the Site shall be used to develop and be included in a Conceptual Site Model and to evaluate potential risks to human health and the environment. The Conceptual Site Model shall provide the basis for selecting sampling locations and the identification of potential remedial technologies.

The characteristics of landfill design, landfill expansions, waste disposal activities, engineering control systems, leachate monitoring, leachate collection, gas collection, berm construction, soil capping, and refuse thickness shall be reviewed, as appropriate, evaluated as part of the scoping process, and utilized in the preparation of the Conceptual Site Model during scoping meetings and documented in the meeting minutes.

2.2.2 Refine And Document Preliminary Remedial Action Objectives And Alternatives

Once existing Site information has been analyzed and an understanding of the potential Site risks has been developed, Respondent shall identify potential remedial action objectives consistent with applicable EPA guidance, including the streamlined RI/FS and presumptive remedy guidances for CERCLA Municipal Landfill Sites for each contaminated medium and a preliminary range of remedial action alternatives and associated technologies. The preliminary remedial action objectives and associated technologies along with the Conceptual Site Model shall be presented in scoping meeting minutes, with EPA participation.

2.2.3 Document The Need For Treatability Studies

If remedial actions involving treatment have been identified by Respondent or EPA, treatability studies shall be

required except where Respondent can demonstrate to EPA's satisfaction that they are not needed.

2.2.4 Begin Preliminary Identification of Potential ARARs

Respondent shall conduct a preliminary identification of potential state and federal ARARs (chemical-specific, location-specific, and action-specific) to assist in the refinement of remedial action objectives, and the initial identification of remedial alternatives and ARARs associated with particular actions. ARAR identification shall continue as Site conditions, contaminants, and remedial action alternatives are better defined.

2.3 Scoping Deliverables

At the conclusion of the project planning phase, Respondent shall submit the scoping meeting minutes identifying the preliminary remedial action objectives and presenting the Conceptual Site Model, a RI/FS Workplan, a Sampling and Analysis Plan, and a Site Health and Safety Plan to EPA. The RI/FS Workplan and Sampling and Analysis Plan must be reviewed and approved by EPA prior to the initiation of field activities.

2.3.1 RI/FS Workplan

A workplan entitled RI/FS Workplan, documenting the decisions and evaluations completed during the scoping process, shall be submitted to EPA for review and approval. The RI/FS Workplan shall be developed in conjunction with the Sampling and Analysis Plan and Health and Safety Plan. The RI/FS Workplan shall include a comprehensive description of the work to be performed, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, the RI/FS Workplan shall include the rationale for performing the activities.

Specifically, the RI/FS Workplan shall state the objectives of the RI/FS. It shall include a background

summary setting forth a description of the Site including the geographic location and Site management; to the extent possible, a description of physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; a synopsis of the history and a description of previous activities that have been conducted by local, state, Federal, or private parties; and a summary of existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media in the vicinity of the Site.

In addition, the RI/FS Workplan shall include a preliminary identification of remedial alternatives consistent with applicable EPA guidance, including the streamlined RI/FS and presumptive remedy guidances for CERCLA Municipal Landfill Sites and data needs for evaluation of remedial alternatives. It shall include a process for and manner of identifying Federal and state ARARs (chemical-specific, location-specific, and action-specific). The RI/FS Workplan shall present a detailed description of the tasks to be performed; information needed from each task; and a description of the work products that shall be submitted to EPA, as set forth in the remainder of this SOW; schedule; project management plan; data management plan; progress reports; meetings; and presentations.

Because of the iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. If any additional data requirements are identified, Respondent shall inform and propose the additional data requirements in a technical memorandum to EPA for review and approval. Respondent is responsible for fulfilling additional data and analysis needs identified by EPA consistent with the general scope and objectives of this RI/FS.

2.3.2 Sampling and Analysis Plan

A plan entitled Sampling and Analysis Plan ("SAP") shall be submitted to EPA for review and approval. It shall set forth plans and procedures to be followed during implementation of the RI/FS. Sampling and analysis shall be conducted in accordance with technically acceptable protocols that meet DQOs. The SAP consists of a Field Sampling Plan ("FSP") and a Quality Assurance Project Plan ("QAPP").

The FSP shall define in detail the sampling and data-gathering methods that shall be used in performing the RI/FS. It shall include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPP shall describe the project objectives and organization, functional activities, and quality assurance and quality control ("QA/QC") protocols that shall be used to achieve the desired DQOs. In addition, the QAPP shall address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting and personnel qualifications. Respondent shall demonstrate, in advance, to EPA's satisfaction, that each laboratory it uses is qualified to conduct the proposed work. The laboratory shall have and follow a QA program approved by EPA. If a laboratory not in the Contract Laboratory Program ("CLP") is selected, methods consistent with CLP methods that would be used for the purposes proposed and QA/QC procedures approved by EPA shall be used. Respondent shall provide assurances that EPA has access to laboratory personnel; equipment; and project records for sample collection, transportation and analysis for the purpose of QA/QC review.

2.3.3 Site Health and Safety Plan

A plan entitled Site Health and Safety Plan, shall be prepared in accordance with OSHA regulations and protocols and submitted to EPA for review. The plan shall include a description of the potential physical and chemical risks present; a description of monitoring and personal protective

equipment; medical monitoring; and Site control. Field personnel shall conform to regulatory training requirements as applicable.

3.0 TASK II - SITE CHARACTERIZATION

As part of the RI, Respondent shall perform the activities described in this Task, including the preparation of a Site Characterization Summary Report and a RI Report. The overall objective of Site characterization is to describe areas of the Site that may pose a threat to human health or the environment. This is accomplished by first determining the Site's physiography, geology, and hydrology. Surface and subsurface pathways of migration shall be defined. Respondent must identify the sources of contamination; and define the nature, extent, and volume of the sources of contamination, including their physical and chemical character as well as their concentrations at incremental locations to background in the affected media. Respondent shall also investigate the extent of migration of contamination as well as its volume and any changes in its physical or chemical characteristics, to provide for a comprehensive understanding of the nature and extent of contamination at the Site. Using this information, contaminant fate and transport is then determined and projected.

During this phase of the RI/FS, the RI/FS Workplan, SAP, and Site Health and Safety Plan are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the RI/FS. Respondent must orally notify EPA's Project Coordinator 14 days in advance of the field work regarding the planned dates for field activities, including ecological field surveys, field layout of the sampling grid, excavation, installation of wells, initiating sampling, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities. If delays occur outside of the planned schedule, the Respondent shall orally notify the EPA project coordinator and adjust the field schedule accordingly. In addition to the deliverables

below, Respondent must provide monthly progress reports and participate in meetings with EPA at major points in the RI/FS.

3.1 Field Investigation

Field investigation includes the gathering of data to define Site physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. These activities shall be performed by Respondent in accordance with the RI/FS Workplan and SAP. This shall include performance of the activities as discussed in the following sections.

3.1.1 Implement And Document Field Support Activities

Respondent shall initiate field support activities following approval of the RI/FS Workplan and SAP. Field support activities may include obtaining access to the Site, scheduling, and procuring equipment, office space, laboratory services, and/or contractors. Respondent shall notify EPA's Project Coordinator 14 days prior to initiating field support activities so that EPA may adequately schedule oversight tasks. Respondent shall also orally notify EPA's Project Coordinator upon completion of field support activities.

3.1.2 Investigate And Define Site Physical And Biological Characteristics

Respondent shall collect data on the physical and biological characteristics of the Site and its surrounding areas including the physiography, geology, hydrology, and specific physical characteristics identified in the RI/FS Workplan. This information shall be ascertained through a combination of physical measurements, observations, and sampling efforts and shall be utilized to define potential transport pathways and human and ecological receptor populations. In defining the Site's physical characteristics Respondent shall also obtain sufficient engineering data (such as pumping characteristics) for the projection of contaminant

fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

The demographics of the region surrounding the Site shall be evaluated, updated, and expanded, as necessary to meet the project objectives and to provide an appropriate and adequate understanding of the following issues:

- Land use and population in the vicinity of the Site;
- The ecological setting of the Site and surrounding vicinity; and
- The biological setting including an analysis of the flora and fauna, any critical habitats and endangered species in the vicinity of the Site.

3.1.3 Define Sources Of Contamination

Respondent shall locate the source of contamination within the landfill. For each location, the areal extent of the various constituents and depth of contamination shall be determined by sampling at incremental depths at appropriate sampling locations. The physical characteristics and chemical constituents and concentrations shall be determined for all known and discovered sources of contamination within the landfill. Respondent shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QA/QC plan and DQOs. Defining the source of contamination shall include analysis of the potential for contaminant release; contaminant mobility and persistence; and the characteristics necessary for evaluating remedial actions and treatment technologies.

The following issues shall be addressed to define the potential sources of impact from the Site.

December 7, 1994 (Revised November 7, 1996)

- Evaluation of disposal practices at the Site to determine the types of materials disposed, the location of disposal activities, and the period of disposal. This may be accomplished by conducting interviews with past employees, a critical review of aerial photographs and subsurface investigations.
- Definition of the horizontal and vertical extent of the contamination, and impacted soils and groundwater.
- Identification of potential mechanisms of release, and/or transport and potential human and environmental receptors.

3.1.4 Physical And Chemical Characterization

Data collected during the field investigation shall enable characterization of the physical framework of the materials at and beneath the Site; and evaluation of potential contaminant distribution and concentration in those materials. Activities to address physical and chemical characterization of these media are discussed in the following sections.

3.1.4.1 Soil And Bedrock Characterization

The physical framework and chemical quality of the soil and bedrock at and beneath the Site shall be determined. Characterization activities shall include, but not be limited to, the following issues.

- Characterization of the lithology and stratigraphy of the soils and bedrock at and beneath the Site.
 - Soil characteristics such as soil type, holding capacity, biological activity, engineering properties, soil temperature, solubility, ion speciation, adsorption coefficients, leachability,

mineral partition coefficients, cation exchange capacity, and chemical and sorptive properties shall be evaluated as such relate to potential occurrence and migration of any contaminants.

- The physical characterization of the unconsolidated profile must include an evaluation of unit morphology, unit thickness, areal thickness, areal extent and local lateral facies changes, and hydraulic properties.
 - Bedrock characteristics such as bedrock stratigraphy, bedrock topography, karstic features, geologic, structural features, mineralogy, cementation, porosity, permeability and other hydraulic properties shall be evaluated as such relate to potential occurrence and migration of any contaminants.
- Determination of the areal and vertical extent of the contaminants. Initial chemical characterization samples shall be analyzed for volatile and nonvolatile organic compounds, total petroleum hydrocarbons, pesticides, PCBs, metals, and cyanides. Based on the results of initial sampling, the analyte list may be reduced to a more focused suite of chemicals.
 - Determination of contaminant migration pathways and the persistence of the contaminants and related impacts.
 - Determination of the extent of leachate migration in soil and bedrock adjacent to potential sources.

3.1.4.2 Hydrogeologic Framework And Groundwater Contamination

The hydrogeologic framework and the extent of potential groundwater impact associated with the contaminants in or originating from the Site shall be characterized.

Characterization activities shall address, but not be limited to, the following issues.

- Determination of the nature of groundwater occurrence and flow beneath and in the vicinity of the Site which may include collection of monthly water levels, performance of aquifer testing, water balance calculations, evaluation of seasonal fluctuation in groundwater levels, seasonal gradient, flow rates and directions, transient gradients and impact to nearby surface water as such relate to potential occurrence and migration of any contaminants.
- Determination of the areal and vertical extent of the contaminants. Initial samples shall be analyzed for volatile and nonvolatile organic compounds, total petroleum hydrocarbons, pesticides, PCBs, metals, radionuclides, and cyanides. Based on the results of initial sampling, the analyte list may be reduced to a more focused suite of chemicals.
- Determination of contaminant migration pathways and the persistence of the contaminants and related impacts.
- Determination of seasonal variations in groundwater chemistry.
- Determination of groundwater flow conditions at and adjacent to the Site to include, but not limited to, the analysis of hydrologic relationships between the Site and the Mississippi River and impact to surface water quality.

3.1.4.3 Surface Water And Sediment Condition

The hydrologic framework and condition of nearby surface water and sediment associated with the contaminants in or originating from the Site shall be characterized.

Characterization activities shall include, but not be limited to, the following issues.

- Collection of climatic and river stage data.
- Determination of surface drainage patterns.
- Determination of the areal and vertical extent of potential surface water and sediment impact and general surface water quality. Initial samples shall be analyzed for volatile and nonvolatile organic compounds, total petroleum hydrocarbons, pesticides, PCBs, metals, and cyanides. Based on the results of initial sampling, the analyte list may be reduced to a more focused suite of chemicals.
- Determination of potential migration pathways and the persistence of the contaminants and related impacts.
- Determination of the seasonal variations in surface water chemistry.

3.1.5 Atmospheric Dispersion

The atmospheric dispersion of contaminants shall be summarized and evaluated to determine the need for further investigations and monitoring.

3.1.6 Climate

Climatic data presented in previous investigation reports should be supplemented with current data. This information shall be needed to evaluate the Site water balance, determine groundwater recharge characteristics in the vicinity of the landfill, determine surface water/groundwater interactions, evaluate seasonal groundwater variations, determine the potential volume of leachate generated in the vicinity of the landfill, etc.

3.1.7 Describe the Nature and Extent of Contamination

Respondent shall gather information to describe the nature and extent of contamination as a final step during the field investigation. To describe the nature and extent of contamination, Respondent shall utilize the information on Site physical and biological characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. Respondent shall then implement an iterative monitoring program and any study program identified in the RI/FS Workplan or SAP such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at the Site can be determined. In addition, Respondent shall gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QA/QC plan and DQOs. EPA will use the information on the nature and extent of contamination to determine the level of risk presented by the Site. Respondent shall use this information to help to determine aspects of the appropriate remedial action alternatives to be evaluated.

3.2 Data Analyses and Evaluation of Site Characteristics

Respondent shall analyze and evaluate the data to describe: (1) Site physical and biological characteristics, (2) contaminant source characteristics, (3) nature and extent of contamination and (4) contaminant fate and transport. Results of the Site physical characteristics, source characteristics, and extent of contamination analyses shall be utilized to evaluate contaminant fate and transport. The evaluation shall include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models must be identified to EPA in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to EPA together with a

sensitivity analysis. The RI data shall be presented in a format (i.e., computer disc or equivalent) to facilitate EPA's preparation of the baseline risk assessment. Respondent shall discuss and then collect any data gaps identified by the EPA that is needed to complete the baseline risk assessment. (See "Guidance for Data Useability in Risk Assessment" OSWER Directive 9285.7-05, October 1990.) Also, this evaluation shall provide any information relevant to Site characteristics necessary for evaluation of the need for remedial action in the baseline risk assessment and for the development and evaluation of remedial alternatives. Analyses of data collected for Site characterization shall meet the DQOs developed in the QA/QC plan stated in the SAP (or revised during the RI).

The Baseline Risk Assessment shall include all the principal contaminants except for any that can be shown to EPA's satisfaction not to be significant.

3.3 Data Management Procedures

The quality and validity of field and laboratory data compiled during the RI shall be adequately and consistently documented during performance of the RI/FS.

3.3.1 Document Field Activities

Information gathered during Site characterization shall be consistently documented and adequately recorded in well maintained field logs and laboratory reports. The method(s) of documentation shall be specified in the RI/FS Workplan and/or the SAP. Field logs shall be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports shall document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

3.3.2 Maintain Sample Management and Tracking

Field reports, sample shipment records, analytical results, and QA/QC reports shall be maintained to ensure that only validated analytical data are reported and utilized in the development and evaluation of remedial alternatives. Analytical results developed under the RI/FS Workplan shall not be included in any site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, a data security system shall be established to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

3.4 Site Characterization Deliverables

An interim investigation technical memorandum shall be submitted during the early phases of implementation of RI field activities upon completion of the interim investigation. A Preliminary Site Characterization Summary shall be prepared and submitted to EPA prior to preparation of the Baseline Risk Assessment. The Remedial Investigation Report shall be prepared upon completion of the Baseline Risk Assessment. A description of these deliverables follows.

3.4.1 Site Characterization Summary

After the field sampling and analysis is completed, a report entitled Site Characterization Summary Report shall be prepared for use in preparing the Baseline Risk Assessment. This summary shall review the investigative activities that have taken place, and describe and display data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected media, location, types, physical state, concentration of the contaminants and quantity. In addition, the location, dimensions, physical condition, and varying concentrations of each contaminant throughout each source and the extent of

contaminant migration through each of the affected media shall be documented.

3.4.2 Remedial Investigation (RI) Report

A draft RI Report shall be prepared and submitted to EPA for review and approval. The report entitled Draft Remedial Investigation Report shall summarize results of field activities to characterize the Site, sources of contaminants, nature and extent of contaminants and associated impacts and the fate and transport of the contaminants. Following comment by EPA, the draft RI report shall be revised and resubmitted as the Final Remedial Investigation Report for final EPA review and approval.

4.0 TASK III - TREATABILITY STUDIES

The potential need for treatability testing shall be evaluated. Based on the results of the evaluation, a technical memorandum entitled Evaluation of Need for Treatability Studies shall be prepared and submitted to EPA stating whether, in Respondent's opinion, a treatability study is warranted.

If treatability testing is deemed necessary by EPA, treatability testing shall be performed by Respondent during Phase II to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions shall be used in the detailed design of the selected remedial technology. The following activities shall be performed by Respondent.

4.1 Identification of Candidate Technologies and of the Need for Testing

Respondent shall identify in a technical memorandum entitled Candidate Technologies for Treatability Studies, subject to EPA review and approval, candidate technologies for a treatability studies program during scoping. The listing of candidate technologies shall cover the range of technologies required for

alternatives analysis. The specific data requirements for the testing program shall be determined and refined during Site characterization and the development and screening of remedial alternatives.

4.1.1 Conduct Literature Survey and Determine the Need for Treatability Testing

Respondent shall conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance ("O&M") requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for the Site on the basis of available information, treatability testing shall be conducted. Where it is determined by EPA that treatability testing is required, and unless Respondent can demonstrate to EPA's satisfaction that they are not needed, Respondent shall develop and discuss with EPA a treatability testing scope of work outlining the steps and data necessary to evaluate and initiate the treatability testing program.

4.1.2 Evaluate Treatability Studies

Once a decision has been made to perform treatability studies, Respondent and EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing should be made as early in the process as possible to minimize potential delays of the FS. To assure that a treatability testing program is completed on time, and with accurate results, Respondent shall either submit a separate treatability testing workplan or an amendment to the original RI/FS Workplan for EPA review and approval.

4.2 Treatability Testing and Deliverables

The deliverables that are required, in addition to the memorandum identifying candidate technologies, where treatability testing is conducted include a workplan, a sampling and analysis plan, and a final treatability evaluation report. EPA may also require a treatability study health and safety plan, or an amendment to the Site Health and Safety Plan.

4.2.1 Treatability Testing Workplan

Respondent shall prepare a plan entitled Treatability Testing Workplan or an amendment to the original RI/FS Workplan for EPA review and approval describing the Site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing shall be documented as well. If pilot scale treatability testing is to be performed, the pilot-scale workplan shall describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-Site, permitting requirements shall be addressed.

4.2.2 Treatability Study Sampling and Analysis Plan ("SAP")

If the original QAPP or FSP is inadequate for defining the activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the original Site SAP shall be prepared by Respondent for EPA review and approval. Task I, Section 2.3.2 of this SOW provides additional information on the requirements of the SAP.

4.2.3 Treatability Study Site Health and Safety Plan

If the original Site Health and Safety Plan is inadequate for defining the activities to be performed during the treatment tests, a separate or amended health and safety plan shall be developed by Respondent. Task I, Section 2.3.3 of this SOW provides additional information on the requirements of the health and safety plan. EPA will review but does not "approve" the treatability study health and safety plan.

4.2.4 Treatability Study Evaluation Report

Following completion of treatability testing, Respondent shall prepare a report, delivered to EPA for review and approval entitled Treatability Study Evaluation Report which analyzes and interprets the testing results. Depending on the sequence of activities, this report may be a part of the Remedial Investigation Report or a separate deliverable. The report shall evaluate each technology's effectiveness, implementability, cost, and actual results as compared with predicted results. The report shall also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

5.0 TASK IV - DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

A range of appropriate waste management options that ensure protection of human health and the environment shall be developed and screened in this task concurrently with Task II (Site Characterization), consistent with applicable EPA guidance, including the streamlined RI/FS and presumptive remedy guidances for CERCLA Municipal Landfill Sites. This range of alternatives should include as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action

alternative. The Respondent shall perform the following activities as a function of the development and screening of remedial alternatives.

5.1 Develop Remedial Alternatives

A range of appropriate waste management options shall be developed that ensure protection of human health and the environment. This development shall occur concurrently with Task II (Site Characterization).

5.2 Refine and Document Remedial Action Objectives

Site-specific remedial action objectives shall be reviewed and modified if necessary. The revised Site-specific remedial action objectives shall be documented in a technical memorandum entitled Refined Remedial Action Objectives that shall be reviewed and approved by EPA. The refined remedial action objectives shall specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

5.3 Develop General Response Action

General response actions shall be developed for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

5.4 Identify Areas or Volumes of Media

Areas or volumes of media to which general response actions may apply shall be identified.

5.5 Identify and Screen Remedial Technologies

Technologies applicable to each general response action shall be identified and evaluated to eliminate those that cannot be implemented. The general response actions shall be refined to

specify remedial technology types. Technology process options for each of the technology types shall be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Process options shall be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The reasons for eliminating alternatives shall be specified.

5.6 Assemble Alternatives

Selected representative technologies shall be assembled into alternatives for each affected medium. Together, all of the alternatives shall represent a range of treatment and containment combinations that shall address the Site. The reasons for eliminating alternatives during the preliminary screening process shall be specified.

5.7 Refine Alternatives

The remedial alternatives shall be refined, taking into account contaminant volume, proposed process, and sizing of critical unit operations. Site specific remediation objectives for each chemical in each medium shall also be modified as necessary to incorporate any applicable risk assessment information presented in the Baseline Risk Assessment report. Additionally, action-specific ARARs shall be updated as necessary.

5.8 Conduct Screening Evaluation of Each Alternative

Respondent may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives shall be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening shall preserve the range of treatment and containment alternatives that was initially

developed. The range of remaining alternatives shall include options that use treatment technologies and permanent solutions to the maximum extent practicable.

5.9 Alternatives Development and Screening Deliverables

A report entitled Development and Screening of Remedial Alternatives shall be prepared summarizing the work performed in and the results of each task above, including an alternatives array summary for EPA review and approval. This deliverable at a minimum shall document the methods, rationale, summary of the assembled alternatives and their related action-specific ARARs, and results of the alternatives screening process including the identification of the action-specific ARARs for the alternatives that remain after screening.

6.0 TASK V - DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

A detailed analysis of remedial alternatives shall be conducted to provide EPA with the information needed to allow for the selection of a remedy. This analysis is the final task to be performed during the FS.

6.1 Detailed Analysis of Remedial Alternatives

A detailed analysis of remedial alternatives shall be conducted consisting of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

6.1.1 Apply Nine Criteria and Document Analysis

The following nine evaluation criteria shall be applied to the assembled remedial alternatives: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume through treatment; (5) short-term effectiveness; (6) implementability; (7) cost;

(8) state acceptance; and (9) community acceptance. For each alternative the following shall be provided: (1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative, and (2) a discussion of the individual criterion assessment.

6.1.2 Compare Alternatives Against Each Other and Document the Comparison of Alternatives

A comparative analysis shall be performed between the remedial alternatives by using the nine evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by EPA. A technical memorandum entitled Comparison of Alternatives shall be submitted to EPA for review and approval which provides a comparative analysis of the alternatives.

6.2 Detailed Analysis Deliverables Feasibility Study (FS) Report

Respondent shall prepare a Draft FS Report for EPA review and comment. This report, as ultimately adopted or amended by EPA, provides a basis for remedy selection by EPA and documents the development and analysis of remedial alternatives. Respondent should refer to the Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01, October 1988) for an outline of the report format and the required report content. Respondent shall prepare a Final FS Report which satisfactorily addresses EPA's comments and is approved by EPA.

7.0 TASK VI - BASELINE RISK ASSESSMENT

A baseline risk assessment shall identify and characterize the toxicity and levels of hazardous substances present, contaminant fate and transport, the potential for human or environmental exposure, or both, and the risk of potential impacts or threats on human health and the environment. It will provide the basis for determining whether or not remedial action is necessary, and a

justification for performing remedial actions. These procedures are outlined below and must be followed as appropriate in the preparation of the baseline risk assessment. EPA guidances that must be utilized, where applicable, when performing the baseline risk assessment include: Framework for Ecological Risk Assessment, (EPA/630/R-92/001) and Risk Assessment Guidance for Superfund which is comprised of the following two volumes: the Human Health Evaluation Manual, (December 1989) (EPA/540/1-89/002), and the Environmental Evaluation Manual, (March 1989) (EPA/540/1-89/001), Superfund Exposure Assessment Manual ("SEAM"), and the Integrated Risk Information System ("IRIS").

7.1 Human Health and Risk Assessment Components

The risk assessment process is divided into the four components listed below. During the scoping of the risk assessment, Respondent shall discuss with EPA the format of the risk assessment report as well as the references to be utilized during the baseline risk assessment.

7.1.1 Contaminant Identification and Documentation

Respondent shall review the information that is available on the hazardous substances present at the Site and will identify the contaminants of concern. The indicator chemicals, or contaminants of concern, are not chosen solely on the basis of chemical-specific ARARs. Rather, they are selected based on quantity, the concentration of contaminants on site as compared to levels that pose a risk, or critical exposure pathways, such as drinking water. When selecting the indicator chemicals, Respondent must also consider the additive effect of risks. Respondent shall submit to EPA for review and approval a technical memorandum listing the hazardous substances present at the Site and the indicator chemicals with the known corresponding ambient concentrations of these contaminants. Chemical-specific ARARs should also be identified at this time.

7.1.2 Exposure Assessment and Documentation

Using the information in the SEAM, Respondent shall identify actual and potential exposure points and pathways. Exposure assumptions must be supported with validated data and must be consistent with EPA policy. Validation of data that has not previously undergone EPA review may be performed as long as it does not delay the RI/FS schedule. For each exposure point, the release source, the transport media (e.g., ground water, surface water, air) and the exposure route (oral, inhalation, dermal) must be clearly delineated. The current number of people at each exposure point must be estimated and, both sensitive and potentially exposed populations must be characterized. Both present and future risks at the Site must be considered, and both current and maximum reasonable use scenarios must be considered. Respondent shall submit to EPA for review and approval a technical memorandum describing the exposure scenarios with a description of the assumptions made and the use of data. This memorandum also shall include a description of the fate and transport models that will be utilized, including a summary of the data that will be used with these models. Representative data must be utilized and the limitations and uncertainties with the models must be documented.

7.1.3 Toxicity Assessment and Documentation

Respondent shall utilize the information in IRIS to provide a toxicity assessment of the indicator chemicals. This assessment shall include the types of adverse health and/or environmental effects associated with chemical exposures (including potential carcinogenicity), the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity (e.g., the weight of evidence for a chemical's carcinogenicity). For those substances lacking an EPA toxicity value for which Respondent wishes to develop its own toxicity value, Respondent shall submit to EPA for review and approval a technical memorandum listing the toxicological and

epidemiological studies that will be utilized to perform the toxicity assessment. All data utilized in the toxicity assessment must be validated and have gone through EPA review. Validation of data that has not previously undergone Agency review may be performed as long as it does not delay the RI/FS schedule.

7.1.4 Risk Characterization

Respondent shall integrate the ambient concentrations and reasonable worst case assumptions with the information developed during the exposure and toxicity assessments, to characterize the current and potential risk to human health and the environment posed by the site. This risk characterization must identify any uncertainties associated with contaminants, toxicities, and/or exposure assumptions.

7.2 Baseline Risk Assessment Deliverables

The approved baseline risk assessment report shall be incorporated into the RI Report (see Task 3).

7.2.1 Baseline Risk Assessment Chapter of the RI Report

The baseline risk assessment report shall be submitted to EPA for review and approval. The report shall include a comprehensive description of the four components of the risk assessment and will follow the principles established in the SPHEM. A discussion of sources of uncertainty, data gaps, incomplete toxicity information, and modeling characteristics must be included. Respondent shall refer to the SPHEM for an outline of the report format.

7.3 Environmental Evaluation and Deliverables

In addition to the human health risk assessment, the risks to the environment from exposure to the contaminants must be addressed.

7.3.1 Environmental Evaluation Plan

Respondent shall submit for EPA's review and approval a plan for the evaluation of the environmental risk. This plan must specify the objectives of the evaluation and the information necessary to adequately characterize the nature and extent of environmental risk or threat resulting from the Site. At a minimum, this plan must demonstrate how the environmental evaluation will address: (1) any critical habitats affected by site contamination; and (2) any endangered species or habitats of endangered species affected by the contamination. Respondent shall utilize the Interim Final Risk Assessment Guidance for Superfund - Environmental Evaluation Manual.

7.3.2 Environmental Evaluation Report

The environmental evaluation report shall be submitted to EPA for review and approval. This evaluation may be included in the baseline risk assessment report or as a document separate from the human health risk assessment. At a minimum, the environmental evaluation report shall include an assessment of any critical habitats, and any endangered species or habitats of endangered species affected by the contamination at the Site.

8.0 SUMMARY OF DELIVERABLES

The following is a table summarizing the RI/FS deliverable documents.

TASK/DELIVERABLE

EPA ACTION

TASK I - SCOPING

- **Workplan:**

Draft RI/FS Workplan

Review and Comment

Final RI/FS Workplan	Review and Approve
Draft Sampling and Analysis Plan (SAP)	Review and Comment
Final Sampling and Analysis Plan (SAP)	Review and Approve
Site Health and Safety Plan	Review and Comment
Interim Action Workplan (if needed)	Review and Approve

TASK II - SITE CHARACTERIZATION

- **Technical Memorandum:**

Modeling of Site Characteristics (if needed)	Review and Approval
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- **Technical Report:**

Site Characterization
Summary Report

Review and Approve

Draft Remedial Investigation (RI) Report

Review and Comment

Final Remedial Investigation Report

Review and Approve

TASK III - TREATABILITY STUDIES

- **Technical Memorandum:**

Evaluation of Need for Treatability Studies
Candidate Technologies For Treatability
Studies (if needed)

Review and Approve

Review and Approve

- **Workplan:**

Treatability Testing Workplan (or amendment
to RI/FS Workplan, if needed)

Review and Approve

Treatability Study SAP (or amendment to

original, if needed) Review and Approve

Treatability Study Site Health and
Safety Plan (or amendment to original,
if needed) Review and Approve

● **Technical Report:**

Treatability Study Evaluation
Report (if needed) Review and Approve

TASK IV - DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

● **Technical Memorandum:**

Refined Remedial Action Objectives Review and Approve

● **Technical Report:**

Development and Screening of Remedial
Alternatives Review and Approve

TASK V - DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

● **Technical Memorandum:**

Comparison of Remedial Alternatives Review and Approve

● **Technical Report:**

Draft Feasibility Study (FS) Report Review and Comment

Final Feasibility Study (FS) Report Review and Approve

TASK VI - BASELINE RISK ASSESSMENT

● **Technical Memorandum:**

Identifying Contaminants and List Review and Approve

Of Proposed Indicator Chemicals

- **Technical Memorandum:**

Description of Exposure Scenarios
and Fate & Transport Models

Review and Approve

- **Technical Memorandum:**

Toxicological & Epidemiological Studies

Review and Approve

- **Report:**

Baseline Risk Assessment Report
(approved Baseline Risk Assessment Report
to be incorporated into RI Report)

Review and Approve

- **Plan:**

Environmental Evaluation Plan

Review and Approve

- **Plan:**

Environmental Evaluation Report
(Respondent may submit as part of
Baseline Risk Assessment Report)

Review and Approve

MISCELLANEOUS

- Monthly Status Reports

9.0 REFERENCES

The following list, although not exhaustive, comprises many of the regulations and guidance documents that apply to the RI/FS process:

The National Contingency Plan, 40 C.F.R. Part 300.

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.

"Presumptive Remedies: Policy and Procedures," U.S. EPA, Office of Solid Waste and Emergency Response, September 1993, OSWER Directive No. 9355.0-47FS.

"Presumptive Remedy for CERCLA Municipal Landfill Sites," U.S. EPA, Office of Solid Waste and Emergency Response, September 1993, OSWER Directive No. 9355.0-49FS.

"Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

"Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, OSWER Directive No. 9835.3

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"EPA NEIC Policies and Procedures Manual," May 1978, revised November 1984, EPA-330/9-78-001-R.

"Data Quality Objectives for Remedial Response Activities," U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

"Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.

"Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.

"Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, August 1982.

"Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

"Draft Guidance on Preparing Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.3-02

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A)," December 1989, EPA/540/1-89/002

"Risk Assessment Guidance for Superfund - Volume II Environmental Evaluation Manual," March 1989, EPA/540/1-89/001

"Guidance for Data Useability in Risk Assessment," October, 1990, EPA/540/G-90/008

"Performance of Risk Assessments in Remedial Investigation /Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," August 28, 1990, OSWER Directive No. 9835.15.

"Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

"Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

OSHA Regulations in 29 C.F.R. § 1910.120.

"Interim Guidance on Administrative Records for Selection of CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

"Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0#3B.

"Community Relations During Enforcement Activities And Development of the Administrative Record," U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1A.

"Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites", U.S. EPA, Office of Emergency Remedial Response, February 1991, EPA Doc. No. EPA/540/P-91/001.2

"Streamlining the RI/FS for CERCLA Municipal Landfill Sites," U.S. EPA, Office of Emergency and Remedial Response, September 1990, OSWER Directive No. 9355.3-11FS.

"Presumptive Remedy for CERCLA Municipal Landfill Sites," U.S. EPA, Office of Emergency and Remedial Response, September 1993, OSWER Directive No. 9355.0-49FS.

"Feasibility Study Analysis for CERCLA Municipal Landfill Sites," U.S. EPA, August 1994.